Introduction

uGrid (Ubiquitous Grid Networking Environment)
- Users are provided contents generated combining data and software (Service-Parts) connected to the network.
  - Faithful to users’ demands
  - Simplification of the apparatus of the sources and users

DCN (Data Centric Network)
- Users require network by contents name.
- Contents in caches return as responses of demands from network.

Energy Efficient
- Cost reduction by avoiding the detour of paths

DCN + DCN + Energy Efficient → E³-DCN

E³-DCN (Energy Efficient, and Enhanced-type Data Centric Network)
- Users require by contents name and receive from cached routers.
- If there are no contents users demand, they are generated combining Service-Parts.

E³-DCN Architecture

The contents users demand are generated combining Service-Parts if needed.

From users’ demands to offers of contents
Step 1) Users require of DCN by contents name.
Step 2) Contents are searched on DCN.
  When found in cache → Contents are transmitted to users on DCN. (End)
  When found in Service-Parts specification → Step 3)
Step 3) Contents are generated combining Service-Parts on DGN, and transmitted to Users.
  - Service-Routing: Paths from sources to users via Service-Parts are determined.
  - Service-Signaling: The paths determined by Service-Routing are established.

Service Copy

Energy efficient system

Present Way
- Paths via fixed Service-Parts are redundant.
  - High cost, Generating of congestion

Proposed Way
- Service-Parts are copied to platforms (Service-Copy).
  - Lower cost, Avoiding congestion

Evaluation

Simulation by Integer Linear Programming

Comparison of the Total-Cost by with Service-Copy and without
- Cost reduction by Service-Copy is so large that there are many users.
  - It is possible for many users to use Copy-Parts after Service-Copy.
- Cost reduction by Service-Copy is so large that service time is long.
  - Execution of Service-Copy requires cost.

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